REMARKS

The application has been amended and is believed to be in condition for allowance.

Claim 3 has been cancelled and incorporated into claim 1.

Claims 15-16 include recitations taken from claim 5.

Other claims were amended as to form.

Claims 17-18 are based on amended claim 1 together with at least specification page 3, lines 26-34; page 7, line 6; and Figure 3 in combination with Figure 1. Claims 19-20 depend respectively from claims 17-18 and specifically recite that an upper part of the rocking edge has a smaller radius of curvature compared to a lower part of the rocking edge.

The specification has been amended to add section headings responsive to the noted objection.

The Abstract has been amended as to form.

The claims were amended responsive to the noted objections.

Drawing Figure 1 was amended to include a Prior Art legend responsive to the drawing objection.

Claims 5 and 7-9 were rejected under §112, second paragraph, as indefinite.

These claims have been amended to remedy the stated bases of rejection. Withdrawal of the rejection is therefore solicited.

Claims 1-4 and 6-10 stand rejected under §102 as anticipated by KANEHARA et al. (JP 2000-74150). Note that U.S. Patent No. 6,440,023 claims priority of JP 2000-74150 and appears to make similar disclosure.

Claim 5 stands rejected under §103 as obvious over KANEHARA et al.

Claims 11-14 stand rejected under §103 over KANEHARA et al. in view of KOBAYASHI 6,074,317.

Amended claim 1 is believed to be both novel and non-obvious over the prior art. Allowance of claim 1 and the claims depending therefrom is solicited.

Applicant has carefully studied KANEHARA et al. as well as JP 06-272737 discussed by KANEHARA et al. (see column 1, lines 49-65).

KANEHARA et al. concern the influence of the radius of curvature of the rocking edge on the Herzian stress and on the total clearance between the transverse elements of the drive belt during operation. When inputted with a maximum allowable value for both the Herzian stress and the total clearance, KANEHARA et al. prescribe, for proper belt operation, a range of values in

which the actual radius of curvature of the rocking edge must lie.

Thus, as taught by KANEHARA et al., the rocking edge as seen in cross-section is defined by a plurality of radii each having the same value. That is, the rocking edge cross-section is shaped as a circle segment.

KANEHARA et al. do not teach or suggest the phenomenon of the extended ratio coverage to which the present invention relates.

JP 06-272737 does relate to the same phenomenon as the present invention. From Figures 1-5, it is clear that in the bent trajectory of the belt, the contact line between the elements significantly displaces from RL (Figure 4) to RS (Figure 5) such that the rocking edge 6 extends over a substantial part of the element's front face (Figure 1). Again, the rocking edge cross-section is defined by a circle segment (as with KANEHARA et al.), only of large radius.

Note that the illustrated embodiment of JP 06-272737 is provided with a constant radius of curvature of 71.5 mm as seen in cross-section. In Figure 6, the effect of such a large radius on the transmission ratio range is shown compared to a rocking edge shaped as a knife's edge (Figures 10-12). That is, the disclosure teaches that the ratio coverage (defined as the

largest possible transmission ration divided by the smallest possible transmission ratio) is indeed increased.

However, neither reference teaches or suggests the recitation of "the curvature of the rocking edge (12) is defined by a plurality of radii (R) that continuously increase in a radially inward direction."

Nor do either reference teach the recited elliptical shape of original claim 4 and the new claims.

Thus, although KANEHARA et al. teach a range between R1 and R2 as allowable values for the rocking edge curvature, only a single and constant value R actually defines the rocking edge. See Figure 2. Also note the Abstract:

> Clearance Cs during a no-load stop and allowable value Cto of total clearance Ct obtained as a sum of clearance Ch occurring due to Hertzian stress are stipulated to a value less than height h of male coupling 28 along with an allowable value .sigma.hmo of the maximum Hertzian stress acting on rocking edge 26 being stipulated to a value less than an upper limit value .sigma.ho of the Hertzian stress that satisfies the opposing pitching lifespan. The radius of curvature R of the rocking edge is set within a range that satisfies R1 <= R <= R2 for the radius of curvature R1 determined in correspondence with the allowable value .sigma.hmo of the maximum Hertzian stress and the radius of curvature R2 determined in correspondence with the allowable value Cto of the clearance between the total elements.

Further, although the applied art may teach that by defining the rocking edge with a relatively large radius of curvature, the ratio coverage of a transmission may be favorably increased without having to increase the dimensions thereof,

there is no suggestion of the recited rocking edge curvature being defined by a plurality of radii that continuously increase in a radially inward direction.

The art teaches that the additional ratio coverage is realized by the feature that a radial position of the contact line on the rocking edge between two adjacent elements (which position determines the effective running radius of the belt on a transmission pulley) is notionally displaced radially inward when the titled orientation, as quantified by the tilting angle (α, β), between two adjacent elements increase.

The larger the radius of curvature, the larger the radial displacement of the contact line in dependence of a variation in tilting angle and the larger the extension of the ratio coverage becomes. See Table 1 and Figure 4 of the present application.

On the other hand, the larger the radius of curvature, the larger the height (radial dimension) of the rocking edge, and, consequently, also of the transverse element itself.

The present invention improves over these prior art elements.

From at least specification page 3, lines 26-34, Figure 3 in combination with Figure 1, independent claims 1 and 17-18 recite the present invention's advantageous configuration that provides the specific feature that in the transmission the drive

belt is either in a straight line trajectory or in a bent trajectory line, wherein the transition between the straight and bent trajectory is discontinuous, i.e., the radius of curvature of the trajectory suddenly changes from infinite (in the straight trajectory part) to a finite value in a limited range (between Rmax and Rmin).

In the initial amount of bending from the infinite radius to the maximum radius of the curved trajectory (Rmax), there is no contribution to extending the ratio coverage. However, during this initial bending, the contact line already displaces radially inward.

The present invention minimizes this "non-usable" displacement of the contact line by defining the upper part of the rocking edge with a relatively small radius of curvature compared to a lower part of the rocking edge.

The upper part of the rocking edge extends from the contact line where the elements contact in the straight trajectory to the radially inward located position of the contact line where the elements contact in a bent trajectory having the maximum radius of curvature (Rmax). Below, i.e., radially inward from this upper part, where the contact line is located as the elements travel between the discs of a pulley, the radius of curvature of the rocking edge is set relatively large to take full advantage of the ratio coverage extending effect thereof.

A rocking edge could thus be defined by only two separate radii (a small radius for the upper part to minimize contact line displacement at the initial tilting and a large radius for the lower part to maximize the contact line displacement at tilting from Rmax to Rmin. As recited by claim 1, a continuously increasing radius of curvature is preferred to obtain a smooth tilting of adjacent elements.

Thus, the embodiment of claim 1 gives a maximum increase in ratio coverage, at a given radial height that is available for the rocking edge.

The invention as recited is believed to be both novel and non-obvious over the prior art. Accordingly, reconsideration and allowance of all the pending claims are respectfully requested.

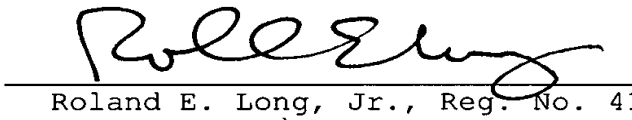
Entry of the above amendments is earnestly solicited. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON



Roland E. Long, Jr., Reg. No. 41,949
745 South 23rd Street
Arlington, VA 22202
Telephone (703) 521-2297

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